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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WILKINS III, HARRY D

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,940

Applicant(s)

PRASAD, ARUN

Examiner

Harry D Wilkins, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-10 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10 and 12-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-3, 5-10 and 12-15 are pending.
2. The rejections under 35 USC 103 based on the Prasad et al reference have been withdrawn in view of Applicant's amendment of the range of Mn.
3. New grounds of rejection, necessitated by the amendment, are presented below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kulmburg (US 5,039,574) in view of Prasad et al (US 4,530,664) and Applicant's admission of prior art.

Kulmburg teaches (see abstract) a Co-Cr dental alloy that contains 25-35 wt% Cr (overlapping at 25-30 wt%), 0.01-8.0 wt% Mn (overlapping at 4.0 to 8.0 wt%) and the balance Co (i.e.-overlapping at 60-68.8 wt%) with other elements being present. Regarding the presence of other elements in the composition of Kulmburg, the present claim recites a composition "comprising", which is defined as leaving the composition open to other elements, even in major amounts. See MPEP 2111.03.

Kulmburg fails to teach adding 1-15 wt% of one or more of Al, In, Ga, Sn or Ge.

Prasad et al teach (see abstract) a Co-Cr dental alloy in the same field of endeavor that includes (as option (iii)) adding 1-6 wt% Al to the alloy. Prasad et al

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teach (see col. 4, lines 10-15) that the Al allows the alloy to be more readily and firmly bonded to porcelain.

Therefore, it would have been obvious to one of ordinary skill in the art to have added 1-6 wt% Al as taught by Prasad et al to the alloy of Kulmburg because the Al allows the alloy to be more readily and firmly bond to porcelain.

Regarding the coefficient of thermal expansion, Kulmburg teaches (see table) a coefficient at room temperature to about 500°C that ranges to at most $15.5 \times 10^{-6}/^{\circ}\text{C}$. However, Applicant admitted as prior art (see page 2, lines 11-13) that newer porcelains are being used with higher coefficients of thermal expansion. It would have been obvious to one of ordinary skill in the art to have adjusted the coefficient of thermal expansion of the alloy of Kulmburg to be usable with the admitted new porcelains. Most of the examples in Kulmburg contain less than 1 wt% Mn, and Mn was well known to increase the coefficient of thermal expansion of alloys (as evidenced by Aisaka et al (col. 2, lines 30-42)). Therefore, when Mn was increased to the upper end of the range disclosed by Kulmburg, one of ordinary skill in the art would have expected the alloy of Kulmburg to possess the coefficient of thermal expansion as claimed.

Regarding claim 2, Prasad et al teach adding Al at 1-6 wt%.

Regarding claim 3, Kulmburg teaches (see abstract) that the alloy also contains 0-1 wt% Fe, 0-0.3 wt% Ni, 0.1-5.0 wt% Nb, 1.0-8.0 wt% Mo and 0.1-5.0 wt% Si.

Regarding the presence of Au and one of Zr, Hf, B, Y or rare earth metals, the present claim recites "up to" which is read to include a zero addition. Therefore, Kulmburg still teaches the composition as claimed.

Regarding claim 5, Kulmburg teaches (see col. 2, lines 65-68) that the alloy had a hardness in the range of 290-410 HV₁₀.

Regarding claims 6-8, Kulmburg teaches (see col. 1, lines 26-37) making dental restorations, such as a bridge, that is coated with a ceramic layer (porcelain). Applicant admitted as prior art (see page 2, lines 11-13) that newer porcelains are being used with higher coefficients of thermal expansion. Therefore, it would have been obvious to one of ordinary skill in the art to have used the high-expansion porcelain in the dental restoration of Kulmburg in view of Prasad et al because the newer porcelains have better properties than older compositions.

6. Claims 9, 10, 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kulmburg (US 5,039,574) in view of Prasad et al (US 4,560,664) and Applicant's admission of prior art as applied to claims 1-3 and 5-8 above, and further in view of Chiaramonte (US 4,108,642).

The disclosure of Kulmburg in view of Prasad et al and Applicant's admission of prior art are discussed above in paragraph no. 5.

Kulmburg in view of Prasad et al and Applicant's admission of prior art do not teach adding 1-5 wt% Au to the alloy.

Chiaramonte teaches (see col. 2, line 57 to col. 3, line 9) that 1-40 wt% Au may be added to Co-Cr dental alloys to give the alloy a gold color, lower the melting point and to improve the mechanical properties of the alloy.

Therefore, it would have been obvious to one of ordinary skill in the art to have added Au as taught by Chiaramonte to the dental alloy of Kulmburg in view of Prasad et

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al and Applicant's admission because Chiaramonte teach that the gold enhanced color, lowered melting point and improved mechanical properties.

Regarding claim 10, Kulmburg teaches (see abstract) that the alloy also contains 0.1-5.0 wt% Nb and 1.0-8.0 wt% Mo. Regarding the presence of one or more of Zr, Hf, B, Y or rare earth metals, the present claim recites "up to" which is read to include a zero addition. Therefore, Kulmburg still teaches the composition as claimed.

Regarding claim 12, Kulmburg teaches (see col. 2, lines 65-68) that the alloy had a hardness in the range of 290-410 HV₁₀.

Regarding claims 13-15, Kulmburg teaches (see col. 1, lines 26-37) making dental restorations, such as a bridge, that is coated with a ceramic layer (porcelain). Applicant admitted as prior art (see page 2, lines 11-13) that newer porcelains are being used with higher coefficients of thermal expansion. Therefore, it would have been obvious to one of ordinary skill in the art to have used the high-expansion porcelain in the dental restoration of Kulmburg in view of Prasad et al because the newer porcelains have better properties than older compositions.

Response to Arguments

7. Applicant's arguments with respect to claims 1-3, 5-10 and 12-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Strietzel (US 2001/0012491) teaches a similar Co-Cr dental alloy to the presently claimed alloy, but has an effective filing date later than Applicant's earliest priority date;
 - b. Rademacher (US 4,728,495) teaches a similar Co-Cr dental alloy.
9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 10:00am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

hdw

Harry D Wilkins, III
Examiner
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ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700